

(12) UK Patent Application (19) GB (11) 2 330 850 (13) A

(43) Date of Printing by UK Office 05.05.1999

(21) Application No 9826991.3

(22) Date of Filing 20.06.1997

(30) Priority Data

(31) 60020239 (32) 21.06.1996 (33) US

(86) International Application Data

PCT/US97/10622 En 20.06.1997

(87) International Publication Data

WO97/48876 En 24.12.1997

(51) INT CL⁶

E21B 10/16

(52) UK CL (Edition Q)

E1F FFD

(56) Documents Cited by ISA

US 5353885 A US 3401759 A

(58) Field of Search by ISA

U.S. : 175/374,378.434,331,341,431

(71) Applicant(s)

Smith International Incorporated
(Incorporated in USA - Delaware)
PO Box 60068, 16740 Hardy Street, Houston,
Texas 77205-0068, United States of America

(72) cont

Per Ivar Nese
Dennis Cisneros
Chris Edward Cawthorne
Madapusi K Keshavan

(72) Inventor(s)

Gary Edward Garcia
Gary Ray Portwood
James Carl Minikus

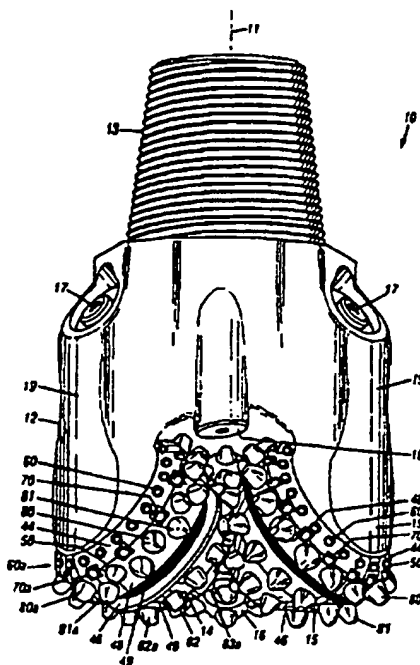
(74) Agent and/or Address for Service

W H Beck, Greener & Co
7 Stone Buildings, Lincoln's Inn, LONDON, WC2A 3SZ,
United Kingdom

(54) Abstract Title

Rolling cone bit having gage and nested gage cutter elements having enhancements in materials and geometry to optimize borehole corner cutting duty

(57) A rolling cone bit (10) having a gage row (80) and an adjacent nested gage row (70) of cutter elements that are positioned on gage so as to divide or share the borehole corner cutting duty. The wear resistance, hardness, toughness and shape of the cutter elements in the adjacent rows (60, 70, 80) are optimized depending upon the type of cutting the respective rows perform, the characteristics of the formation being drilled and the drilling techniques being employed. In most applications, the nested gage cutter elements (70) will have cutting surfaces that are more wear resistant or harder than the cutting surfaces of the gage cutter elements (80) which experience more bottom hole duty. The nested gage cutter elements (70) engage the borehole wall with a negative rake angle for increased durability. Preferably, the nested gage cutter elements (70) have continuously contoured and non-shearing cutting surfaces.



BEST AVAILABLE COPY

GB 2 330 850 A